

Practical No 1

Aim: Using, linux-terminal or Windows-cmd, execute following networking commands and note the output: ping, traceroute, netstat, arp, ipconfig, getmac, hostname, NSLookUp, pathping, systemInfo

Theory:

- 1) **ping:** ping is a computer network administration software utility used to test the reachability of a host on an Internet Protocol network. It is available for virtually all Operating systems that have networking capability, including most embedded network systems and administration software
- 2) **traceroute:** The traceroute command(tracert) is a utility designed for displaying the time it takes for a packet of information to travel between a host system and the final destination system. This command returns a list of the hops that the data packets take along their path along their way to the destination
- 3) **netstat:**The netstat provides statistics about all active connections so you that we can find out which computers or networks a PC is connected to
Some of the netstat commands commonly used are
 - i) **netstat-in command**
This netstat function shows the state of all configured interfaces.
 - ii) **netstat-a command**
The netstat-a command shows the state of all sockets.
 - iii) **netstat-s**
The netstat-s command shows statistics for each protocol(while the netstat -p command shows the statistics for the specified protocol).
 - iv) **netstat-r**
Another option relevant to performance is the display of the discovered Path Maximum Transmission Unit (PMTU).
- 4) **arp:** The ARP(Address Resolution Protocol) commands are used to view, display, or modify the details/information in an ARP table/cache.
Some of the common arp commands are as follows
 - i) **arp-a:** This command is used to display the ARP table for a particular IPaddress. It also shows all the entries of the ARP cache or table.
 - ii) **arp-g:** Same as the arp-a command.
 - iii) **arp -d:** This command is used to delete an entry from the ARP table for a

- particular interface. To delete an entry, write `arp -d` command along with the IP address in a command prompt to be deleted.
- iv) `arp -s`: This command is used to add the static entry in the ARP table, which resolves the `InetAddr(IPaddress)` to the `EtherAddr(physicaladdress)`. To add a static entry in an ARP table, we write `arp -s` command along with the IP address and MAC address of the device in a command prompt.
 - 5) `ipconfig`: `ipconfig` (Internet Protocol CONFIGuration) is used to display and manage the IP address assigned to the machine. In Windows, typing `ipconfig` without any parameters displays the computer's currently assigned IP, subnet mask and default gateway addresses.
 - 6) `getmac`: `getmac` is a Windows command used to display the Media Access Control (MAC) addresses for each network adapter in the computer.
 - 7) `hostname`: A hostname is a label that is assigned to a device connected to a computer network and it is used to identify the device.
 - 8) `NSlookup`: Using this command we can find the corresponding IP address or domain name system record. The user can also enter a command for it to do a reverse DNS lookup and find the host name for an IP address that is specified.
 - 9) `Pathping`: This command sends multiple echo Request messages to each router between a source and destination, over a period of time, and then computes results based on the packets returned from each router. It can be used to find the routers or links having network problems.
 - 10) `SystemInfo`: This command is used to display detailed configuration information about a computer and its operating system, including operating system configuration, security information, product ID, and hardware properties.

Click on the link or scan the QR-code for the video demonstration of the practical:

<https://youtu.be/CeMNBxW5LsM>

